



materialise magics
3D print suite

The Software of Choice for Additive Manufacturing

Product Overview	5
3-matic: Design Optimization	6
Magics: Data and Build Preparation	10
e-Stage: Automatic Support Generation	14
Build Processor: Machine Communication	16
Magics Print: Machine-Tailored Build Preparation	18
Control Platform: Machine Control and Steering	20
Inspector: Process and Quality Control	22
Streamics: Production Management	24
Custom Development	26
Training and Consultancy	28

3D printing has evolved into a mature industrial manufacturing technique adopted by an ever-growing range of industries. For advanced adopters, we know the key challenges are not only technological, they're also economical. You are in a race to boost **productivity and efficiency** in your 3D printing production, and it's a race in which the decisive factor can be software.

To help you realize your projects, scale up your production, and establish an efficient 3D printing business, Materialise leverages its nearly three decades of 3D printing experience in the development **of premium Additive Manufacturing (AM) software solutions**. Our open, flexible platform enables you to build innovative 3D printing applications, unrestricted by your choice of AM technology or printing machine.

The Materialise Magics 3D Print Suite includes design optimization, industry-leading data and build preparation software, quality inspection tools and production management systems, **offering an end-to-end software Suite** for AM production factories. It also includes software and control systems used by machine manufacturers to **better bridge the gap between applications and 3D printers**.

Together, the Suite enables you to continuously raise your 3D printing productivity and connect to the world's largest AM ecosystem.



Consultancy

Becoming an AM expert can help solve some of your toughest business challenges, including whether you should set up your own factory or outsource. Tap into our extensive AM knowledge by learning the latest in 3D printing in our training sessions, or get one-to-one support to discuss the unique opportunities AM can bring to your business through our consultancy services.

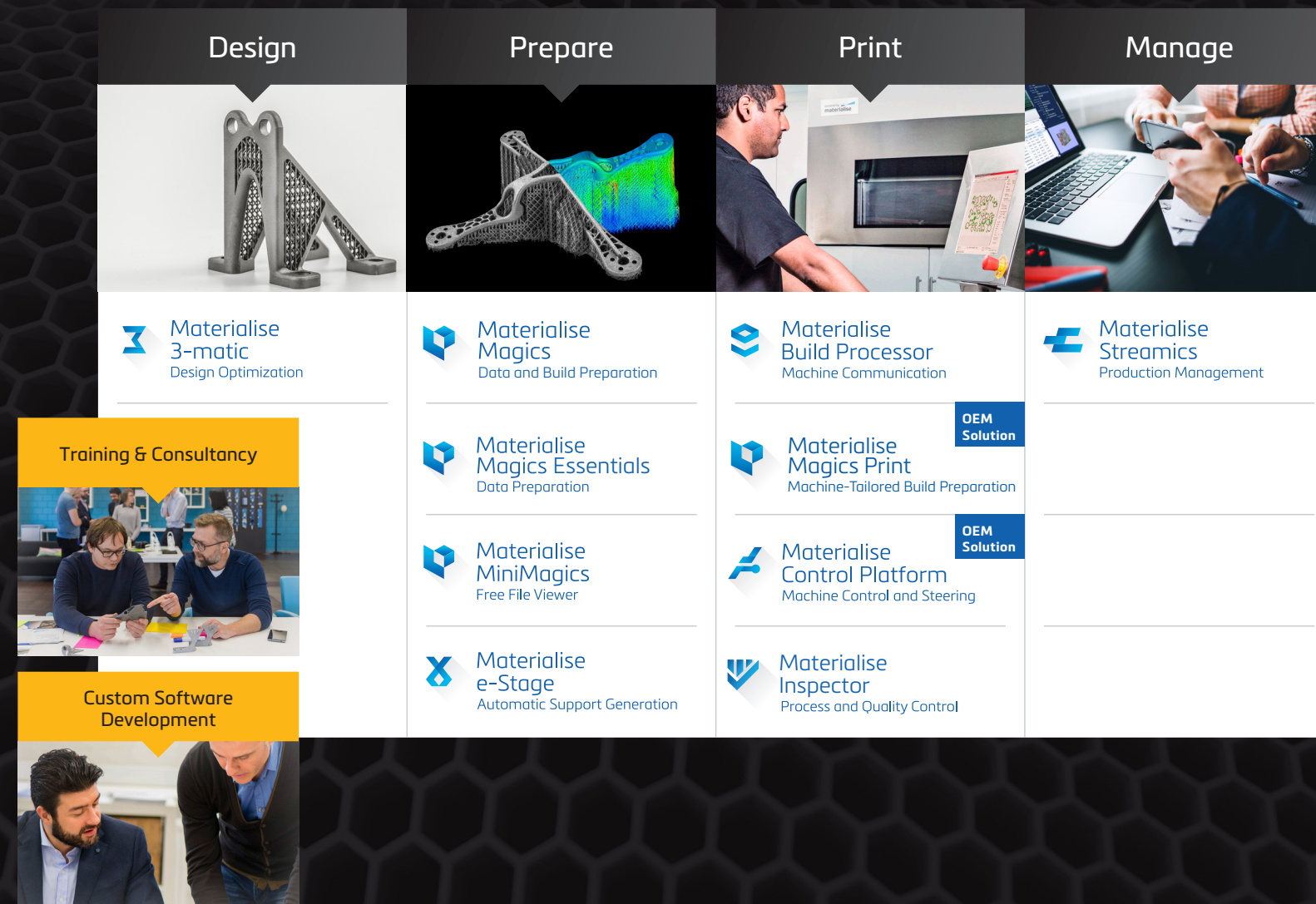
Productivity

While equipment and material advancements are driving the development of new applications, industrial 3D print factories are looking for ways to raise output while reducing costs. Meanwhile 3D printing service bureaus are operating in an increasingly cost-competitive environment. Materialise software enables companies to scale their operations, use resources more efficiently, and reduce costs.

Connectivity

Adoption of AM as a serial or mass customization production technology keeps on gaining interest from different manufacturing markets. To set up an AM factory or scale your current AM production you can tap into our capabilities to reach profitability faster and to connect additive manufacturing into an end-to-end digital supply chain. With Materialise, you can access the widest range of AM software in the market, which are open platforms that connect to the majority of AM machines available and which allows AM integration with existing distributed manufacturing systems such as ERP and MES, for example.

materialise magics 3D print suite



Create the Best Designs for 3D Printing

A great design for 3D printing usually starts with a CAD file, simulation result, or scanned data as input. To benefit from the possibilities that 3D printing offers, you need a flexible tool to make specific design modifications or enhancements, often at the mesh level. Whether you want to produce a functional automotive part, a lightweight aerospace part, or fascinating shoes, our specialized software helps you optimize your designs with an unprecedented degree of freedom.

Why choose Materialise 3-matic?

- Enjoy freedom of design, create a unique or customized object
- Control density with lattice, conformal, and porous structures
- Save material, reduce printing time, and decrease costs with lightweight designs
- Change aerodynamic, acoustic, and cushioning properties or increase grip
- Avoid labor-intensive finishing steps with smart use of textures
- Gain foresight from the strong link with simulation packages
- Automate your design process or accelerate your iteration cycles by scripting these flows using the 3-matic Python API

Design with Materialise 3-matic

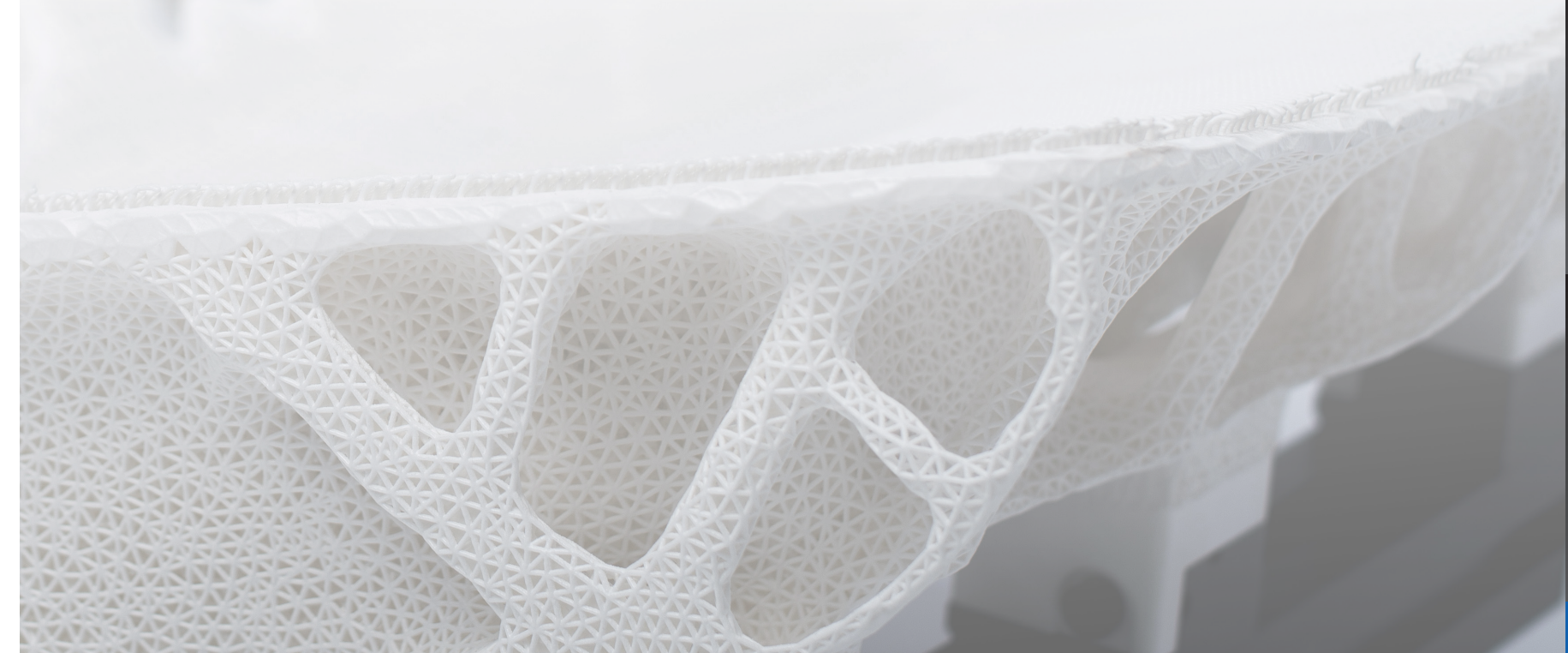
- Modify your design at mesh level
- Create textures, patterns, and perforations
- Create lattice, conformal, or porous structures
- Clean up rough topology optimization results for simulation (FEA) and printing
- Convert your mesh back to CAD

Lightweight Design in Action: Removing 18 kg from Toyota's Car Seat

Working with Materialise, Toyota Motor Corporation and Toyota Central R&D Labs Inc. produced a lightweight car seat prototype with a minimal volume and an optimal heat capacity. The manipulation, transfer and build of this very complex and extremely large file (250 GB) could only be achieved with Materialise's slice-based operations technology. The final result was that Toyota's car seat volume could be reduced by 72%, which corresponds to a weight reduction from 25kg to 7kg.

"A great design is strong. Even when 18 kg lighter."

Dr Atsushi Kawamoto, Senior Researcher/Program Manager,
Toyota Central R&D Labs., Inc., Japan.



Materialise 3-matic

Design Optimization

MODULE

Remesh Module

Fully prepare your parts for CAE applications.

- Optimize using both manual and automatic remesh operations
- Export to a variety of file formats
- Retain surface mesh, volume mesh, and lattices during export

MODULE

All Imports Module

Import nearly all standard CAD formats with the Import Module.

- Manage the resolution of your data while importing to ensure high STL quality
- Retain native color information
- Receive a repaired file after the import
- Keep CAD surface structure

MODULE

Scripting Module

Automate your design process to conveniently replicate your work and customize as many variations as you need.

- Script with Python
- Increase consistency and productivity
- Manage jobs
- Easily expand or adapt workflows for future projects
- Minimize risk of human error

MODULE

CAD Link Module

Easily return your file to CAD format.

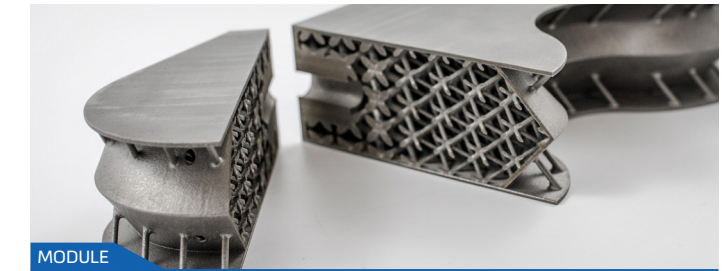
- Converts analytical shapes with the correct parameters
- Transforms organic shapes to NURBS to obtain a fully parametric design



Texturing Module

Apply textures, perforations, and patterns to complex 3D shapes directly within an STL file.

- Enhance performance or aesthetics of a part
- Avoid applying textures during post-processing
- Maintain control over your design and avoid outsourcing to create textures



Lattice Module

Form 3D-printable internal and external structures that add extra strength, increase porosity, or simply reduce the weight of your design.

- Choose from a large collection of available structures
- Add or design unique unit cells

SLICE-BASED TECHNOLOGY

Materialise 3-matic is enhanced by Materialise Build Processor, which is equipped with our slice-based technology. By generating textures or lattice structures at the slice level, the user can skip the demanding triangularization to an intermediate STL file, thereby avoiding large file sizes.





Boost Your Productivity in 3D Printing

Materialise Magics is a smart, versatile data preparation software for additive manufacturing equipped with a customizable, intuitive user interface.

Our industry- leading software efficiently guides you through every step of your 3D printing workflow.

Materialise Magics is a technology-neutral modular solution. Whether you want to generate support for your metal or resin parts or nest multiple parts on your laser sintering machine, Magics offers all the modules you need to print parts with the highest efficiency. It allows you to view slices, detect collisions, save platforms, and generate useful reports.

Discover our Materialise Magics modules
on pages 12-13.

Why choose Materialise Magics?

- Prepare build platforms faster
- Reduce lead times
- Save material
- Get every part printed right the first time

Prepare parts with Materialise Magics

- Import all data types and formats
- Repair and prepare files for all technologies
- Edit and enhance data
- Prepare build platforms
- Rely on reports and measurements for quality control
- Perform simulations

“We receive files from outside sources that need substantial CAD time to create a watertight model. Magics allows us to do this in half the time.”

Paul Bates, Director, Advanced Process Engineering and Gary Rabinovitz, RP Manager
Reebok International Ltd., Canton, Massachusetts, United States

The Power of Magics, Scaled to Your Needs

Materialise MiniMagics

MiniMagics is a free tool for everyone.

- Visualize your STL files
- Make measurements
- Include text annotations

Materialise Magics Essentials

Magics Essentials is the solution for you if you're looking to combine a flexible licensing arrangement with powerful data preparation capabilities.

- Take your first step into the versatile world of Magics data preparation
- Get started easily by purchasing online
- Prepare your models and save costs with a flexible monthly or annual subscription

Materialise Cloud

Cloud brings you instant access to Materialise's 3D printing software technology through your browser.

- Prepare your models for 3D printing using your web account
- Save time using only essential data preparation tools
- Get started easily with the cloud-based application
- Keep costs down with a pay-per-use plan



Materialise Magics

Data and Build Preparation

MODULE

Import Module

Import nearly all standard CAD formats with the Import Module.

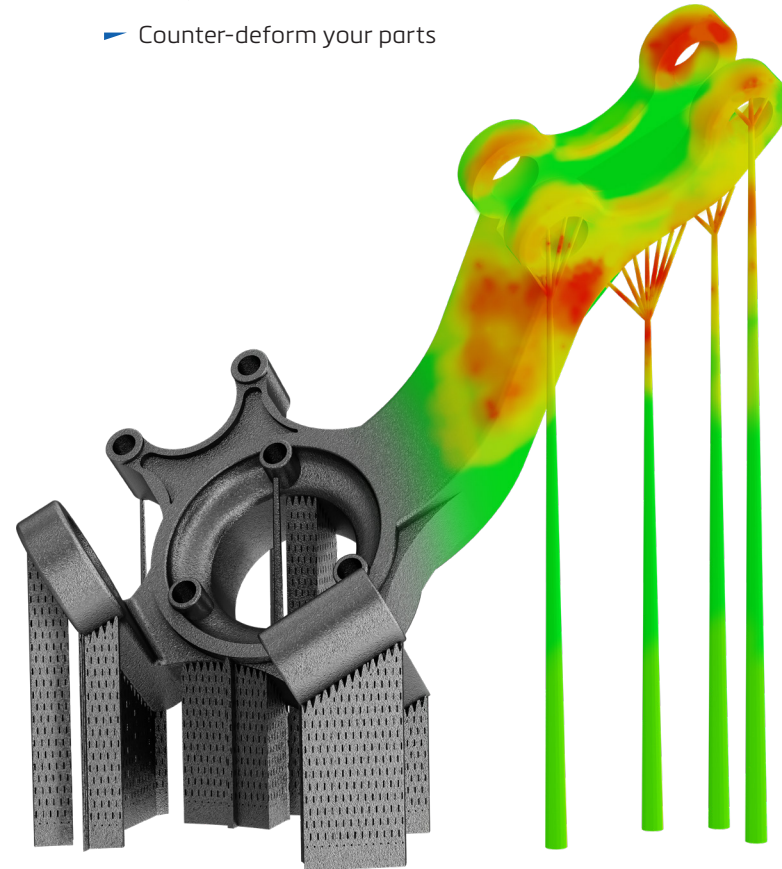
- Manage the resolution of your data while importing (for better STL quality)
- Import native color information
- Receive a repaired file after the import

MODULE

Simulation Module

Predict build errors in your metal production with the Simulation Module.

- Create calibration profile
- Set up mechanical and thermal simulation
- Analyze the results
- Counter-deform your parts

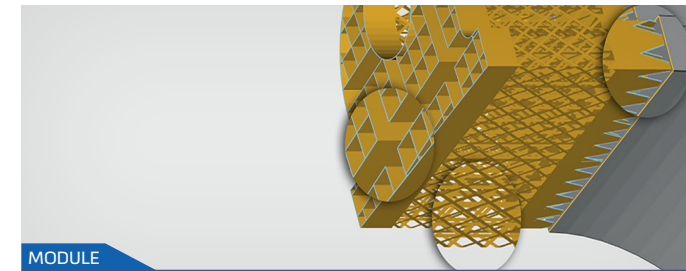


MODULE

SG+ Module

Generate and design support structures for metal parts with the SG+ Module.

- Conduct heat and avoid deformation
- Optimize part orientation
- Recuparate powder
- Reduce build failures with build validation tools



MODULE

SG Module

Generate and design optimal support structures for resin parts with the SG Module.

MODULE

Sinter Module

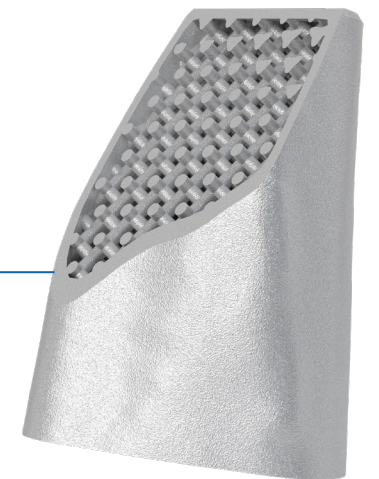
The Sinter Module provides a complete toolbox to make your Laser Sintering business time- and cost-efficient, while reducing build failures.

- Nest parts quickly and automatically on multiple platforms
- Control the build time, height and density
- Avoid interlocking and colliding parts
- Create protective crates
- Easily add parts to an existing configuration
- Manually position a part and continue with auto-nesting

MODULE

Structures Module

Create lattice structures with the Structures Module.





Materialise e-Stage Automatic Support Generation

Save Time and Costs by Generating Support Structures Automatically

Whether you have one machine or 50, by automating your support generation you will reduce material costs and save an impressive amount of time on support generation and post-production finishing.

Our customers run our patented Materialise e-Stage on more than 40 different Stereolithography and DLP machines with over 40 materials. Besides resin-based machines, Materialise e-Stage is also suitable for Metal 3D Printing builds.

Generate support with Materialise e-Stage

- Automatic support generation in a few clicks
- Minimal contact points
- Needle-thin supports
- DLP, Stereolithography, and laser-based metal printing.

Why choose Materialise e-Stage?

- Eliminate human errors
- Improve part quality
- Optimized build process
- Increase success rate of builds
- Scalable as your machine park grows

For Metal

- Reduce support removal time by up to 50%
- Decrease operation time by 90%
- Recover 20% of metal powder

For Resin

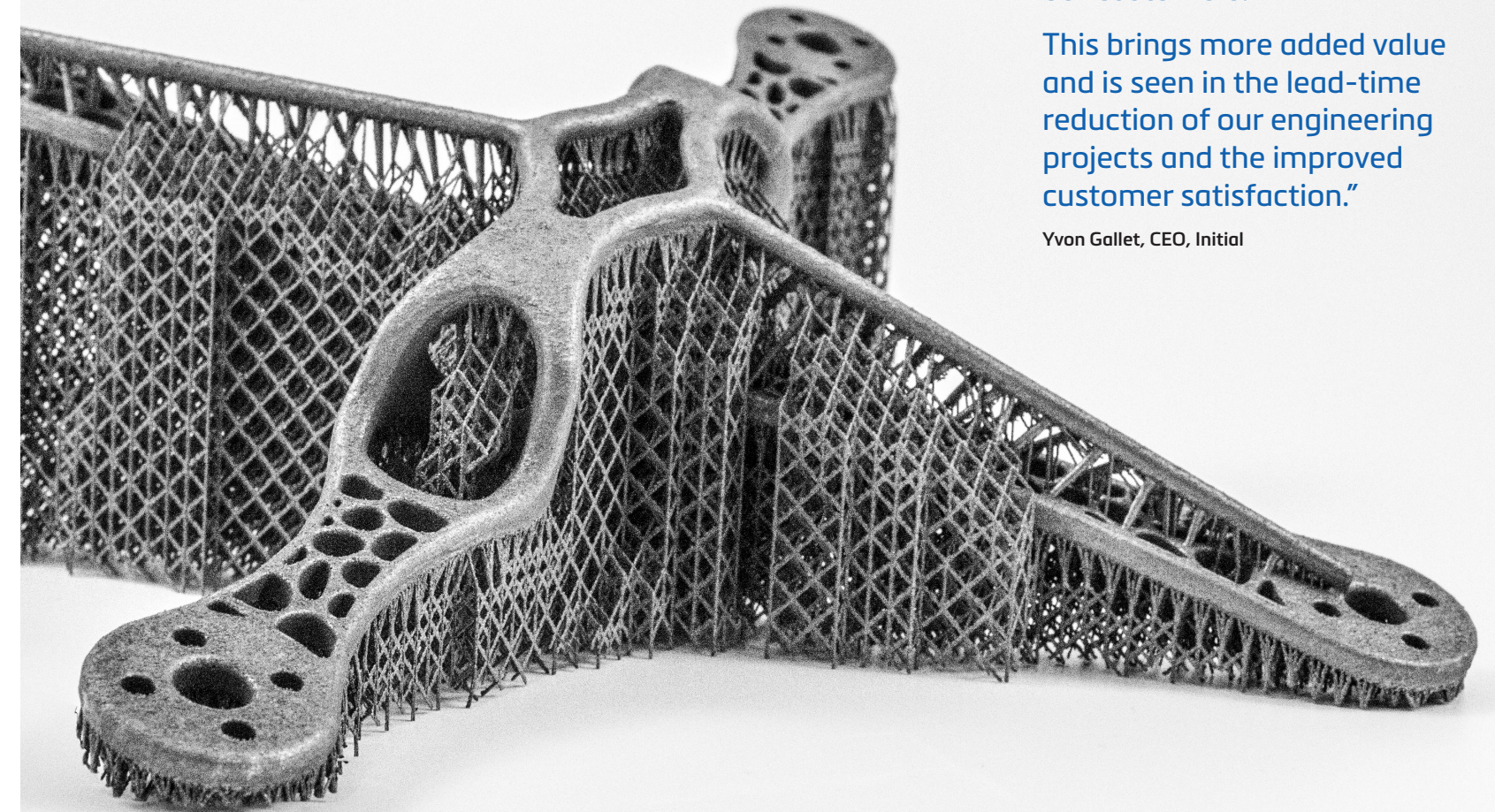
- Reduce resin consumption up to 15%
- Reduce finishing time by 20%

"I no longer wanted to sacrifice my best engineering people to the labor-intensive task of support generation.

e-Stage does it automatically now, and we can be sure the build will be successful. Now my engineers can use their time to work together with our customers.

This brings more added value and is seen in the lead-time reduction of our engineering projects and the improved customer satisfaction."

Yvon Gallet, CEO, Initial



© Project in collaboration with volum-e



Materialise Build Processor Machine Communication

Get the Most Out of Your 3D Printing Machine

3D printers are complex, and getting the desired result requires knowledge of machine parameters, processes, and materials. To seamlessly link software with hardware and reduce the complexity of 3D Printing, the Materialise Build Processor simplifies machine communication through a straightforward user interface.

Materialise has strong partnerships with the majority of leading AM machine manufacturers worldwide and several key CAD/CAM software manufacturers. For independent software vendors, the Materialise Build Processor offers a single API interface. We provide the software platform and toolbox, then the AM machine manufacturer feeds it with process-specific knowledge. Together we bridge the gap between 3D printers and enable game-changing applications.

Why choose Materialise Build Processor?

- Easily translate 3D information into machine-specific instructions for printing
- Simplify 3D printing machine communication
- Access the de facto industry-standard software tailored to each machine
- Efficiently process even very large platform files using slice-based technology
- Benefit from the integration with other software from the Materialise Magics 3D Print Suite
- Join Materialise's ever-growing partner network and build on our expertise

Communicate with the Materialise Build Processor

- Out-of-the-box support for most printing technologies
- Intuitive user interface
- Seamless integration with data preparation
- Open software architecture enables third-party software integration which results in user-friendly end-to-end workflows
- Centralized build profile management
- Advanced, multicore slicing algorithms
- High degree of automation
- Two-way communication between the machine and Build Processor with Streamics integration



“With the Build Processor, there is a lot of flexibility – the user is able to control up to 170 parameters, fully utilizing Renishaw’s open source parameter ethos. However, it maintains a user-friendly interface, using predetermined parameters so that the build can be prepared in a few simple steps.”

David Ewing, Renishaw plc



130+

Most of the leading AM machine manufacturers and vendors package Materialise software in combination with their machine. Others have worked with us to develop a dedicated Build Processor or customized solutions for their system. For independent software vendors, the Materialise Build Processor offers a single API to connect to different printers and technologies. The Build Processor Framework enables smooth end-to-end AM workflows by integrating directly with the CAD/CAM software partners of Materialise.



Materialise Magics Print Machine-Tailored Build Preparation

OEM
Solution

Connect Your Machine to Essential Data Preparation Software

To simplify the customer's experience with your machine, we developed Materialise Magics Print, an entry-level data preparation software that allows users to print on any machine.

With Magics Print, users can repair files and prepare them for 3D printing. The connection with a technology-specific Materialise Build Processor gives the user access to fast and accurate slicing technology and enhances the communication between software and 3D printer. In addition, Materialise Magics Print is fully compatible with other software solutions from the Materialise Magics 3D Print Suite.

“Materialise Magics Print broadens our offer to machine manufacturers. This easy-to-use software package gives users the possibility to tap into our data preparation, support generation, and build set-up expertise.”

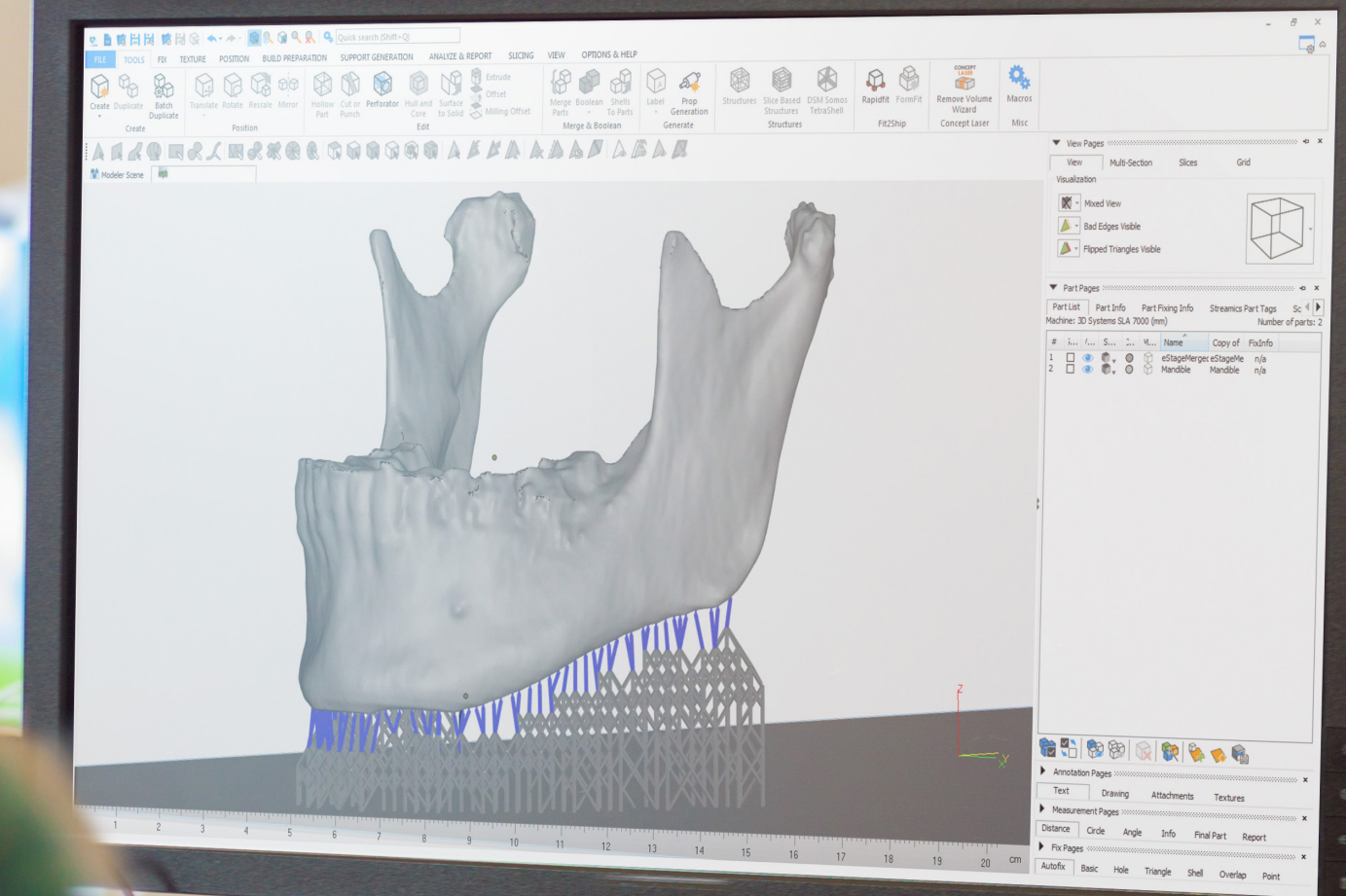
Max Heyrman , Solution Architect at Materialise

Why choose Materialise Magics Print?

- Access the industry standard for data preparation
- Offer customers fast build-platform preparation
- Avoid build failures and reduce build time
- Benefit by connecting to Materialise's state-of-the-art Build Processors

Bring your machine to the next level with Materialise Magics Print

- Repair, edit, and slice files with a powerful toolbox
- Generate optimal support structures
- Benefit from unmatched slicing speed and precision
- Handle large and complex files with our unique slice-based processing algorithms



“By partnering with Materialise, we aim to further improve the service we offer our customers by giving them access to Materialise's industry-leading software, with a data-preparation solution that will improve the user experience both before and after a part is 3D printed”

Byungkeuk Lee, CEO of Carima



Materialise Control Platform Machine Control and Steering

OEM
Solution

Control and Monitor Your Machine

Quality and repeatability are important for Additive Manufacturing. The Materialise Control Platform was created with this in mind. The platform adds real-time control and monitoring of the machine to the well-known ecosystem of the Magics 3D Print Suite. The Materialise Control Platform ensures that the additive manufacturing process is predictable, stable, and consistently operating at the target level of performance.

Why choose the Materialise Control Platform?

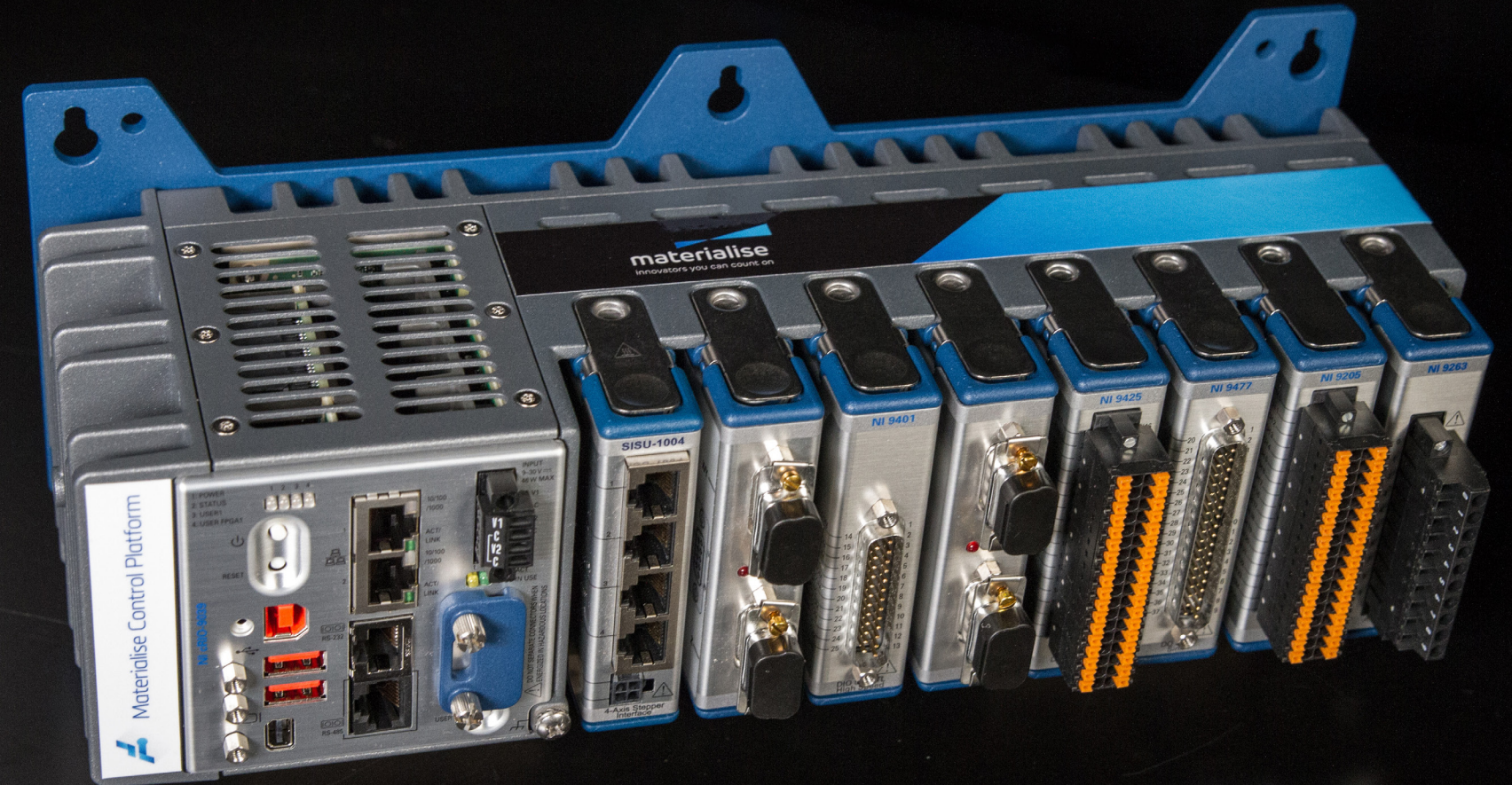
- Feel confident with a solution developed specifically for AM, backed by our industry-leading 3D printing competencies.
- Extend the open software architecture with your IP
- Shorten your lead-time for developing new machines
- Simplify your workflow with an integrated end-to-end platform
- Benefit from numerous applications
- Work with any laser-based AM technology

Monitor your machine with the Materialise Control Platform

- Monitor the additive manufacturing process
- Run inspection algorithms in real-time

“We, at Sentrol, greatly appreciate and value our partnership with Materialise because it provides us with build processing and control solutions that are customized for our products. This in turn enables us to offer optimal and complete hardware and software solutions to our own customers.”

Casey HJ Kim, Vice President, Sentrol Co., Ltd.





Materialise Inspector
Process and Quality Control

Control What You Print

Assuring the quality of the production process is essential to any manufacturing business. When applying 3D Printing, it becomes even more essential. During the building process, material and part properties are formed, leading to the need to control and monitor the production process closely.

To ensure that the printed part corresponds to your design, you can rely on Materialise Inspector. This control tool will allow you to analyze data coming from all stages of the production process, from 3D geometry and toolpath to finished part, in order to improve and guarantee its quality.

Why choose Materialise Inspector?

- Increase confidence in the quality of your printed parts
- Predict and detect errors with less effort
- Save time and material with a root cause analysis of failed builds
- Experiment with print styles and other research parameters
- Benefit from our complementary solutions in the field of R&D, manufacturing and prototyping

Analyze your machine data with Materialise Inspector

- Inspect the build process strategy
- Set criteria for image analysis
- Perform a post-build analysis to enhance quality control

“Errors in data preparation can be expensive and even dangerous in cases of component failure. To ensure we’re always developing high-quality parts for our customers in a timely manner, Fraunhofer ILT uses Materialise Inspector Slice Viewer to inspect the core of each additive manufacturing project as it’s being built.”

Christoph Gayer, Research Associate at the Fraunhofer Institute for Laser Technology ILT





Manage and Streamline Your AM Production Process

If you want to start manufacturing end-use parts with Additive Manufacturing technology while your AM business grows, you will require a software backbone to efficiently manage, scale, and automate your production process.

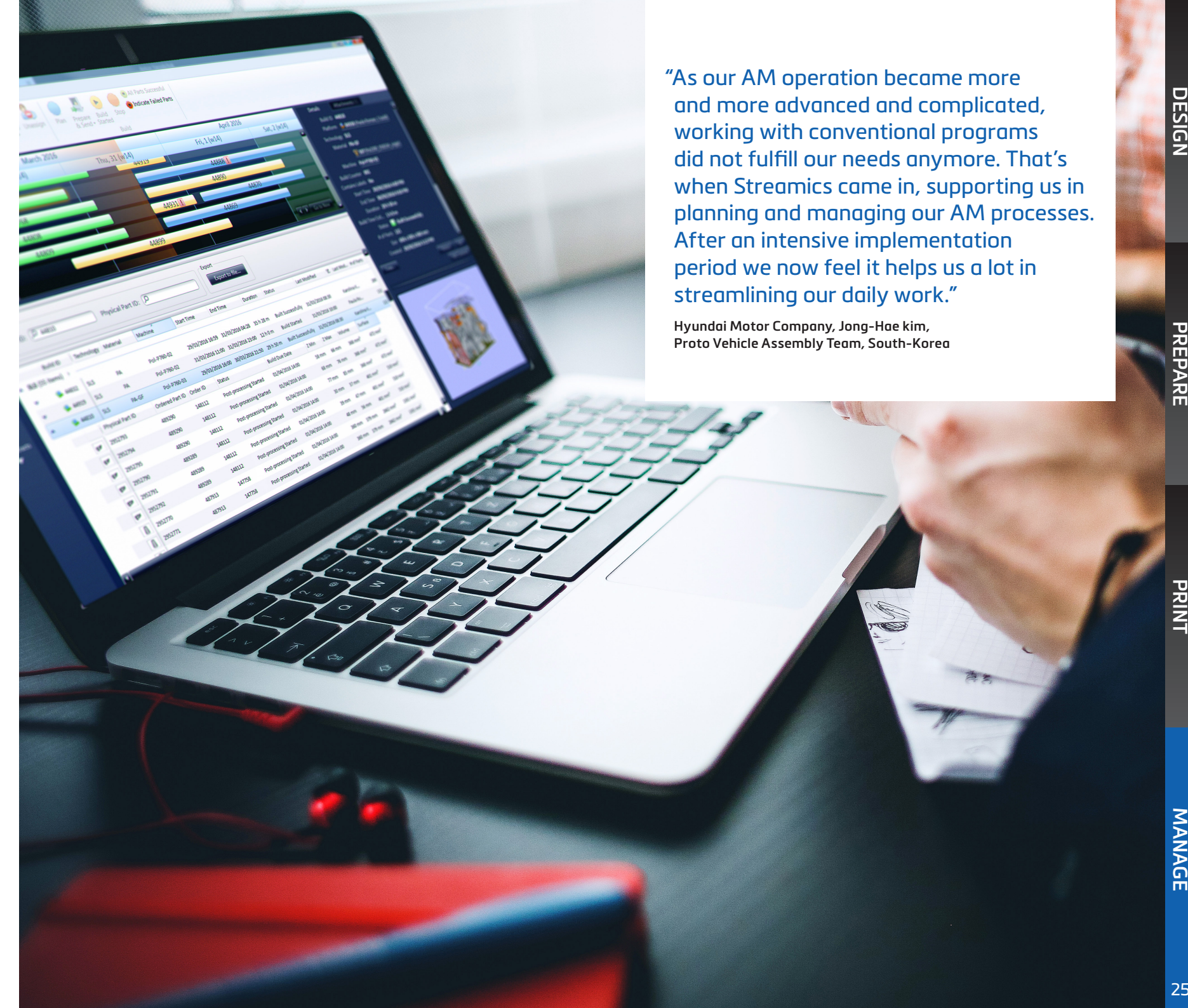
To comply with the specific standards of your industry, the system will need to be able to track and trace when and how each a part was created, in what circumstances, with what machine parameters, etc. Materialise Streamics is a central AM production management system that enables the efficient implementation of your AM business, offering repeatable quality while saving time and excessive administration.

Why choose Materialise Streamics?

- Efficiently implement AM into your existing business model and manage it
- Scale your AM production with confidence
- Ensure repeatable part quality
- Guarantee lifetime traceability of your production
- Expand production with any AM machine type and technology

Manage production with Materialise Streamics

- Manage orders through an online portal
- Central access to all key AM data
- Process simplification and control
- Optimal build preparation and scheduling
- Automation of file operations, including part labeling
- AM machine integration
- Integration into your enterprise's systems



“As our AM operation became more and more advanced and complicated, working with conventional programs did not fulfill our needs anymore. That’s when Streamics came in, supporting us in planning and managing our AM processes. After an intensive implementation period we now feel it helps us a lot in streamlining our daily work.”

Hyundai Motor Company, Jong-Hae kim,
Proto Vehicle Assembly Team, South-Korea



Custom Development

No matter what level of custom development you are looking for, we can create bespoke solutions to put the power of 3D printing into your hands. Your tailor-made AM software will maintain a competitive edge thanks to Materialise's patented technology and decades of experience, as well as our collaboration with other industry leaders. You receive solutions to match your specific needs based on an open architecture, which we develop in close cooperation and coordination with you.

Co-Create

Enable your application for:

- 3D Printing
- Mass customization
- Automated engineering
- Process optimization

Connection

Connect your 3D printing machine to the Materialise Magics 3D Print Suite

- Rely on the powerful technology of the Build Processor and Controller
- Get the most out of your machine with a tailored solution

Integration

Integrate 3D Printing into your own software platform

- Empower your online platform with our technology
- Integrate with design software (CAD), manufacturing (CAM), PLM or other third-party applications

"What we were looking for was not only a manufacturing partner but an all-around collaborator at every stage."



Accelerate the Adoption of AM

3D Printing is being adopted by an ever-growing range of industries. We're right in the middle of the industrialization of Additive Manufacturing and we realize that a firm basis in AM knowledge is the foundation of any 3D printing success story. We're here to help you build that foundation and apply it in your business.

Explore

Access comprehensive knowledge regarding 3D printing and discover sustainable applications that enable you to apply Additive Manufacturing in your business.

Applications

Discover with us the sustainable applications that enable you to apply the benefits of additive manufacturing in your business.

Productivity

Get guidance to take the quality and the profitability of your Additive Manufacturing processes to the next level.

Machine Development

Bring your new AM machine to the market faster and connect it with production environments.

Connectivity

Embed Additive Manufacturing into your digital factory workflow.

"The #1 challenge for industries in the process of adopting 3D printing technologies is the lack of internal 3D printing knowledge."

Jabil 3D Printing Trends Survey 2019



Highlights from our Training Portfolio



Masterclass in Metal 3D Printing

The factors affecting build success are numerous, and the costs at stake can rise quickly. At Materialise, we've acquired extensive experience in Metal 3D Printing over the years. Knowledge we've gained from that experience is exactly what we offer you in this two-day workshop.

for Process owners and AM team members that are relatively new to Metal printing

- Speed up the learning curve: attendees report saving 3 to 9 months of self-study and research
- Obtain practical insights and learn how to avoid build failures

Discover the full program and sign up for an open session in your region
materialise.com/academy

Software Training and Tutorials

Training is the best way to guarantee you're enhancing your productivity and maximizing the return of your software investment. 3D printing is an ever-changing process, and it's crucial to ensure that you're keeping up with the newest techniques and developments.

- Book a **private training session** for your company
- Join one of our **open training classes**
- Get started with our **tutorial movies**

"I would recommend this course both to companies that are beginning to integrate AM as well as to companies that are looking for specific information on printing and defects on parts. The Masterclass provides a great foundation and understanding of how the process parameters affect the quality of the parts"

Carlos Furtado, Materials and Process Engineer,
ASCO Industries



We Speak Your Language

Materialise HQ

Phone: +32 16 39 66 11
Fax: +32 16 39 66 00
E: software@materialise.be

Technologielaan 15
3001 Leuven, Belgium

United Kingdom

Phone: +44 1143 997 846
Tech. Support: +44 1143 997848
Fax: +44 1143 520 092
E: software@materialise.co.uk

AMP Technology Centre
Advanced Manufacturing Park
Brunel Way
Catcliffe - Sheffield
S60 5 W

Germany (Munich)

Phone: +49 8105 77 859 20
Fax: +49 8105 77 859 19
E: software@materialise.de
materialise.com/de/software

Friedrichshafener Str.3
82205 Gilching
Germany

Germany (Bremen)

Phone: +49 421 994074-30
Fax: +49 421 944074-49
E: info@marcam.de
materialise.com/de/software

GmbH
Mary-Somerville-Straße 3
D-28359 Bremen
Germany

Australia

Phone +611 -800-990-217 (Toll Free)
E: software@materialise.com.my

India

Phone +91 80-4803-0577
E: software@materialise.com.my

USA

Phone: +1 734 259 6445
Fax: +1 734 259 6441
E: software@materialise.com

44650 Helm Court
Plymouth, MI 48170
USA

Japan

Phone: +81 45 440 45 91
Fax: +81 45 440 45 92
E: info@materialise.co.jp
materialise.com/ja/software

Yokohama Partside Bldf. 2F
Sakoe-cho 8-1
Kanagawa-ku, Yokohama
Japan 221-0052

Malaysia

Phone: +60377241415
Fax: +60377241406
E: software@materialise.com.my

Unit 5-01; Menara OBYU
No. 4, Jalan PJU 8/8A
Damansara Perdana
47820 Petaling Jaya
Selangor Darul Ehsan
Malaysia

China

Phone: +86 21 583 124 06
Fax: + 86 21 583 124 05
E: software@materialise.com.cn
materialise.com/zh-hans/software

Booshan District
Hutai Roa 2999
Building 1
Shanghai 200444
P.R.China

South Korea

Phone +82 70-4186-4700
E: support@materialise.co.kr
materialise.com/ko/software

Singapore

Phone +65 3158-6191
E: software@materialise.com.my